



Symphony[™]

**Air-Cooled
Variable Speed Drive
Screw Chillers**

Super Efficient · Super Quiet



Cooling Capacity
Range 540-1405 kW R134a

World's first low sound Air-Cooled variable speed drive screw chiller

The recognition for energy efficient chillers is more apparent now than ever before. YORK has more than 25 years experience in the development of inverter driven large capacity water-cooled chillers. We now proudly introduce "Symphony" the Worlds first low sound Air-Cooled variable speed drive screw chiller.



Symphony chillers are finely tuned to provide features of ultimate importance:

- Flexible model range and options to suite your requirements.
- Highest operating efficiency at all conditions.
- Sound reduction options to suit most environments.
- Designed with built-in reliability.
- Low maintenance costs.
- Low installation costs.
- Economical operating costs.
- Fuzzy Logic control.

Flexible Model Range

Four levels of operating efficiency:

- Standard.
- Standard with optimised ESEER.
- High Efficiency.
- High Efficiency with optimised ESEER.

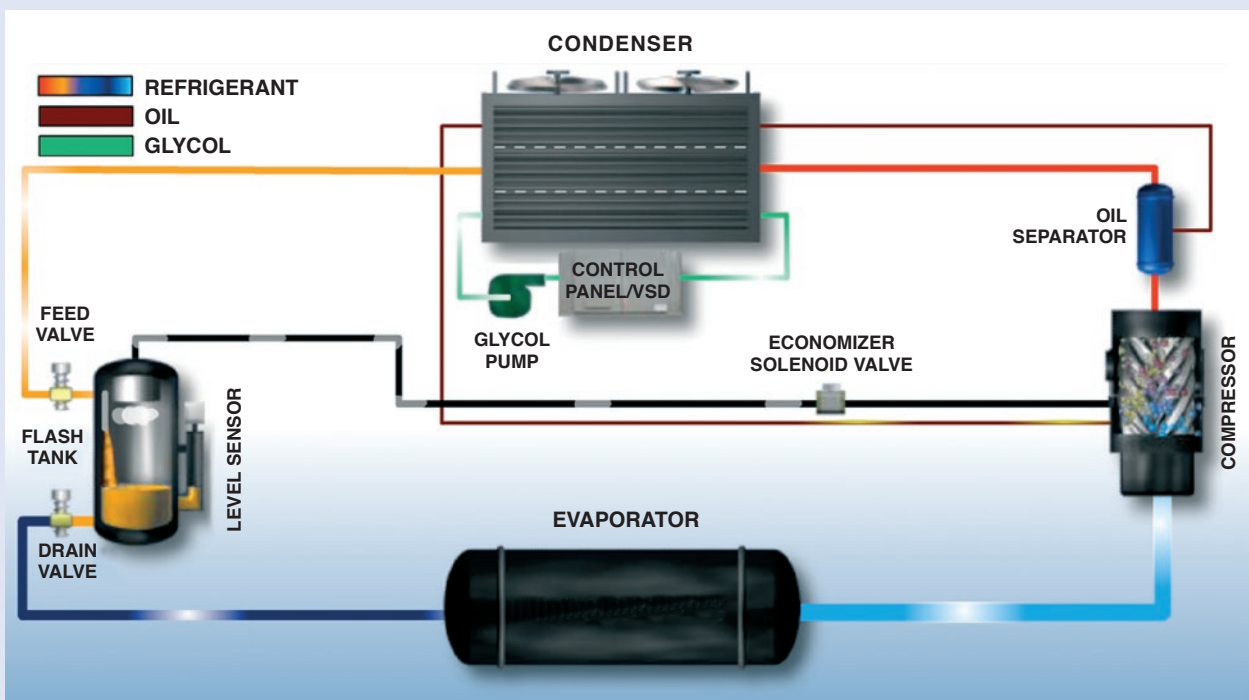
Refrigerant Flow Diagram

Low-pressure liquid refrigerant enters the cooler tubes and is evaporated and superheated by the heat energy absorbed from the chilled water passing through the cooler shell.

Low-pressure vapour enters the compressor where pressure and superheat are increased. High-pressure vapour is passed through the oil separator where oil is removed, from the refrigerant, and recirculated to the compressor via the oil cooler. High-pressure oil-free vapour is fed to the air-cooled condenser coil where heat is rejected to the air that is forced across the coil surface by fans. The fully condensed liquid refrigerant enters the

feed stepper motor valve that controls the liquid flow to maintain a constant liquid level in the Flash Tank. The drain stepper motor valve functions as an Electronic Expansion Valve and controls the compressor suction superheat.

The Economiser Solenoid Valve controls a medium pressure vapour feed to the compressor economiser port. When the valve is open refrigerant vapour flashes off, in the flash tank, to provide additional subcooling to the liquid in the tank. The subcooled liquid is then fed to the evaporator. Increasing both the subcooling and the superheat therefore enhances the cooling capacity.





Highest Operating Efficiency at all Conditions Provides Low Operating Costs

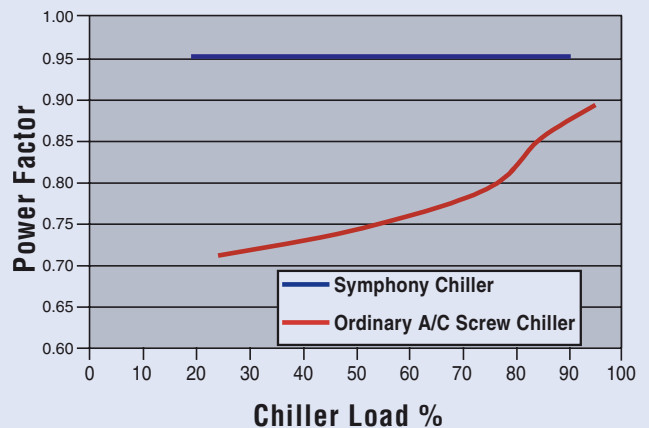
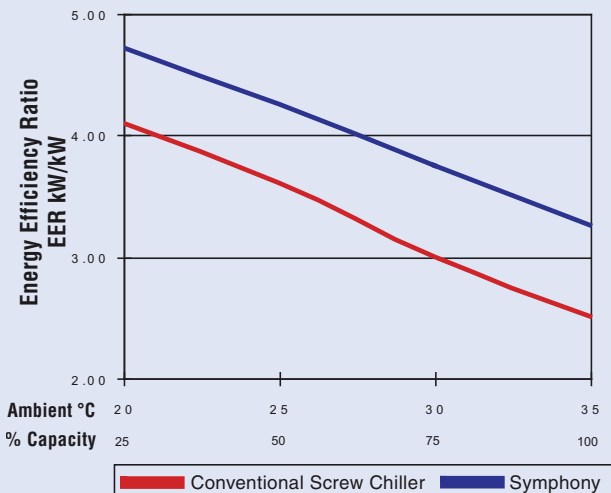
Symphony has been designed to provide high operating efficiencies at all conditions.

The incorporation of variable speed compressor technology, electronic expansion valves and optimised part load control results in class A full load Energy Efficiency Ratios (EER) as high as 3.2 and European Seasonal Energy Efficiency Ratios (ESEER) that exceed 4.0. These high efficiencies together with high 0.95 power factor at all operating conditions, result in economical operating costs.

Optimised European Seasonal Efficiency (ESEER) Control

Smart Anticipatory Control determines how many compressors need to start to satisfy the current cooling load. It keeps as many compressors possible on line, and reduces the speed, in an effort to optimise the use of the entire evaporator tube surface to ensure optimum efficiency at all conditions.

CHILLER EFFICIENCY





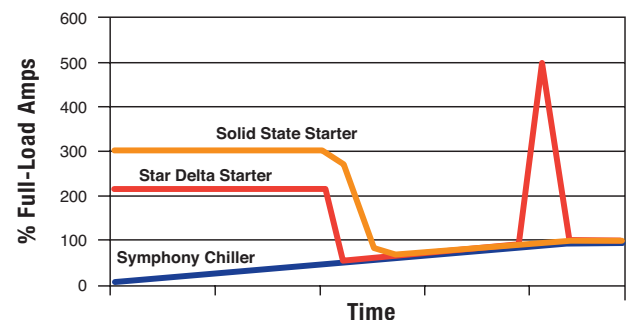
Increased Reliability and Low Maintenance Costs

The heart of the **Symphony** chiller is the YORK MTS semi-hermetic screw compressor. The following design features provide increased reliability and low maintenance costs:

- Each compressor motor has a dedicated inverter, to match motor speed to cooling demand; there is no slide valve, return spring or control solenoid. Therefore this simple dual screw rotor compressor has 50% less moving parts than conventional screw compressors.
- **Symphony** controls monitor compressor runtime and start-ups and automatically switch the lead and lag compressors to balance operating hours.

- The soft start characteristics of variable speed drive, the starting current never exceeds full load amps, eliminates any compressor starting stress.

Another advantage, of low starting current, is that standby generators are smaller than those required for conventional screw chillers.

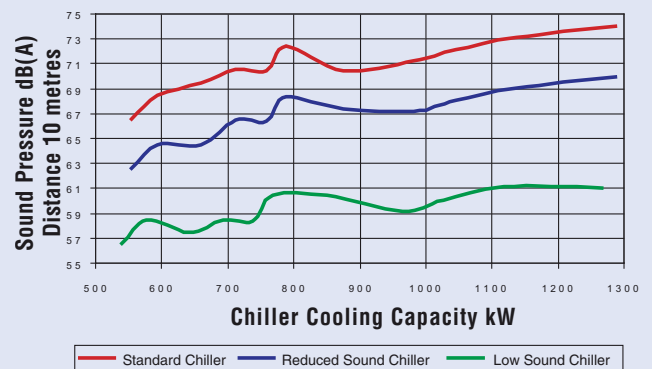


Sound Reduction Options to suit most Environments

Each efficiency level has a selection of three acoustic options:

- **Standard sound level** Generally applicable for daytime operation in city centres etc.
- **Reduced sound level** For daytime operation where background noise is lower.
- **Low sound level** For night and day operation near residential areas etc.

SYMPHONY SOUND OPTIONS



Technical data

Standard Efficiency Model YCIV-SE-RS	0600	0650	0720	0770	0840	0920	1000	1070	1180	1340	1500
Cooling Capacity kW (1)	562	620	678	727	793	870	949	994	1104	1251	1405
Energy Efficiency Ratio (EER)	2.93	2.94	2.98	2.94	3.02	3.02	3.03	2.97	2.98	2.99	3.00
Energy Class	B	B	B	B	B	B	B	B	B	B	B
ESEER (2)	4.03	4.01	4.05	4.01	4.05	4.09	4.14	4.08	4.09	4.12	4.19
Sound Pressure at 10 Metres dB(A)	65	65	66	65	68	67	67	69	70	71	72
Standard Efficiency Low Sound Model YCIV-SE-LS	0600	0650	0720	0770	0840	0920	1000	1070	1180	1340	1500
Cooling Capacity kW (1)	547	604	660	708	772	848	914	968	1075	1217	1368
Energy Efficiency Ratio (EER)	2.72	2.72	2.76	2.72	2.80	2.80	2.81	2.75	2.76	2.77	2.78
Energy Class	C	C	C	C	C	C	C	C	C	C	C
ESEER (2)	4.07	4.05	4.10	4.05	4.09	4.14	4.18	4.12	4.13	4.16	4.24
Sound Pressure at 10 Metres dB(A)	58	57	59	58	60	60	60	60	61	64	64
High Efficiency Model YCIV-HE-RS	0590	0630	0700	0760	0800	0830	0930	1050	1120	1220	1380
Cooling Capacity kW (1)	556	595	661	714	760	791	876	983	1047	1139	1289
Energy Efficiency Ratio (EER)	3.16	3.17	3.16	3.13	3.18	3.21	3.13	3.14	3.14	3.14	3.14
Energy Class	A	A	A	A	A	A	A	A	A	A	A
ESEER (2)	4.07	4.10	4.09	4.07	4.07	4.09	4.11	4.14	4.14	4.14	4.19
Sound Pressure at 10 Metres dB(A)	63	64	64	66	66	68	67	67	68	69	70
High Efficiency Low Sound Model YCIV-HE-LS	0590	0630	0700	0760	0800	0830	0930	1050	1120	1220	1380
Cooling Capacity kW (1)	541	579	643	695	740	770	853	957	1019	1109	1255
Energy Efficiency Ratio (EER)	2.94	2.95	2.94	2.91	2.96	2.99	2.90	2.92	2.92	2.92	2.91
Energy Class	B	B	B	B	B	B	B	B	B	B	B
ESEER (2)	4.11	4.14	4.13	4.11	4.11	4.13	4.16	4.18	4.18	4.19	4.24
Sound Pressure at 10 Metres dB(A)	57	58	57	58	58	60	60	59	60	61	61

(1) At 7°C leaving chilled water and 35°C ambient.

(2) ESEER = European Seasonal Energy Efficiency Ratio

Accessories

The following accessory options can be provided:

- **High Static Fans:** Providing 100 pa external static pressure
- **Condenser Coil Fins:** plain aluminium or copper, epoxy pre-coated aluminium or the whole aluminium finned coil can be epoxy dipped and cured.
- **Unit Protective Panels:** heavy gauge wire mesh or painted steel louvres.
- **Pressure Relief Service Valve Kit**
- **Evaporator water connections:** field fit victaulic flange kits can be provided.
- **Liquid Flow Detection:** switch or differential pressure switch.
- **Building Automation System Interface:** Leaving chilled water reset and electrical current limiting.
- **Vibration Isolation:** Neoprene pads, spring isolators or seismic spring isolators.


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